U-WAVE-R

User's Manual
No.99MAL109B3

Introduction

The U-WAVE-R in conjunction with a Mitutoyo U-WAVE-T (available separately) allows wireless communication of the measurement data from Digimatic-output interfaced tool to load it to a personal computer for data display.
To obtain the highest performance and the longest service life from the U-WAVE-R, carefully read this User's Manual thoroughly prior to use.
After reading this manual, keep it near the U-WAVE-R for quick reference.
The specifications of the U-WAVE-R and descriptions in this manual are subject to change without prior notification.

Safety Precautions

Use the U-WAVE-R in conformance with the specifications, functions and precautions for use given in this manual. If the U-WAVE-R is used in other way, it may jeopardize safety.

WARNING

- Do not use the U-WAVE-R near a medical device that has a possibility of causing a malfunction due to radio waves.
- The U-WAVE-R using an electric wave has a possibility that communication is interrupted under the influence of external noises, etc., even within the distance of communication of the electric wave. In this case take sufficient failure prevention action (security measures).
- In the event the U-WAVE-R should fail, take sufficient failure prevention action (security measures).

Notes on Export Regulation

WARNING

The U-WAVE-R falls into the Catch-All-Controlled Goods or Program under the Category 16 of the Separate Table 1 of the Export Trade Control Order or the Category 16 of the Separate Table of the Foreign Exchange Control Order, based on the Foreign Exchange and Foreign Trade Law of Japan.
Further, this User's Manual and U-WAVE Quick Manual (No. 99MAL110B) also falls into the Catch-All-Controlled Technology for use of the Catch-All-Controlled Goods or Program, under the Category 16 of the Separate Table of the Foreign Exchange Control Order.
If you intend re-exporting or re-providing the product or technology to any party other than yourself, please consult with Mitutoyo prior to such re-exporting or re-providing.

Precautions for the Wireless Law

The U-WAVE-R can use in Japan, EU member countries, U.S.A, Canada .
The U-WAVE-R cannot be used in countries other than Japan, EU member countries, U.S.A, Canada

WARNING

- The U-WAVE-R must follow the corresponding regulation which is specified in the country to use an electric wave.
- Do not disassemble or modify any part of the U-WAVE-R.
- Do not peel off the following certification label stuck on the U-WAVE-R. The use of any U-WAVE-R without the label is prohibited.
- Do not use the U-WAVE-R in an airplane. The use of a wireless equipment in the airplane is prohibited.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notes

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications, However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- **-- Reorient or relocate the receiving antenna.**
- **-- Increase the separation between the equipment and receiver.**
- **-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**
- **-- Consult the dealer or an experienced radio/TV technician for help.**

Precautions on Wireless Communication Environments

Notice that this performance of the U-WAVE-R may not be fully delivered depending on the environment such as a midway obstruction.
For the items of obstruction factors refer to the following table.

1) The U-WAVE-R may not be able to communicate in the case.

Item	Description
Concrete wall	Disables communication if the U-WAVE-R is completely enclosed with a concrete wall.
Metallic partition, etc.	Have the possibility of reducing the communication speed or blocking communication.
Wireless LAN, Bluetooth, ZigBee, microwave oven, and other communication devices	Have the possibility of reducing the communication speed or blocking communication. Separate the communication channel (band ID) and installation site of each device as far as possible from those of the U-WAVE-R.
Machine tools, etc.	In the worksite operated with machine tools such as electrical discharge Machines, crane for transfer, arc welding etc., have the possibility of reducing the communication speed or blocking communication.

2) The U-WAVE-R may influence on the peripheral equipment in the case

Item	Description
Medical device	Do not use the U-WAVE-R near a medical device such as a laser surgical knife and a bathroom scale.

Precautions for Use

The following deeds and situations will cause a failure or malfunction in the U-WAVE-R. Care should be exercised.

IMPORTANT

- The U-WAVE-R operates on the power supply from a personal computer. A personal computer may generate large noises depending on the manufacturer and model. Be sure to verify the whole system operation once prior to use.
- Do not give a sudden shock such as a drop or apply an excessive force to the U-WAVE-R.
- If the U-WAVE-R is not used more than 3 months, disconnect the U-WAVE-R from the personal computer and store it in a safe place.
- Avoid using or storing the U-WAVE-R at sites which are exposed to direct sunlight, excessively high or low temperature.
- Avoid using or storing the U-WAVE-R at sites where it may be subject to the adhesion of solution such as acid and alkali or organic solvent.
- If a high-voltage device such as an electro-spark engraving pen is used for the U-WAVE-R, the internal electronic parts may be damaged.
- Exercise care so as not to apply an undue force or curvature to the USB cable.

Warranty

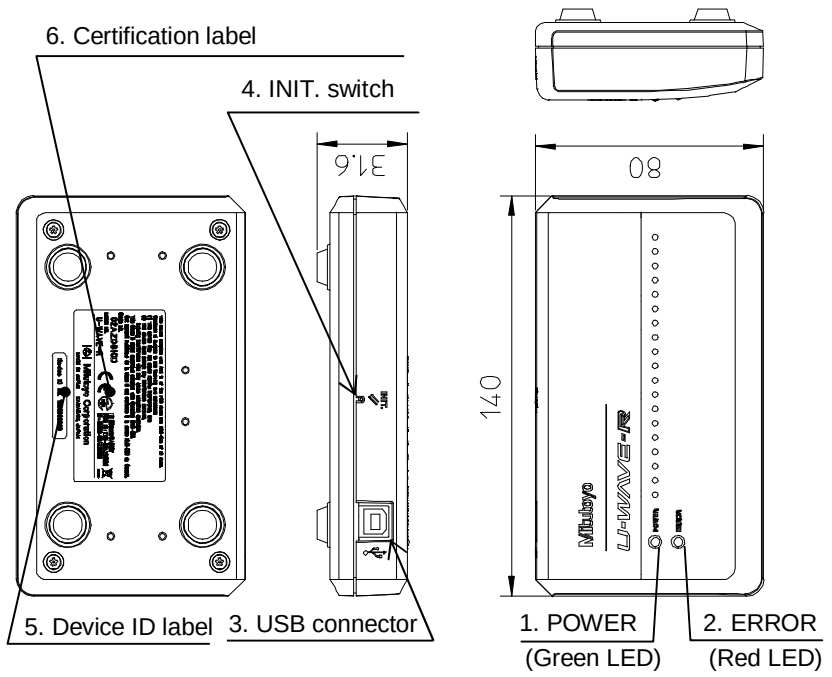
In the event that the U-WAVE-R should prove defective in workmanship or material, within one year from the date of original purchase for use, it will be repaired or replaced, at our option, free of charge upon its prepaid return to us.
This warranty is effective only where the U-WAVE-R is properly installed and operated in conformance with the instructions in this manual.

Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)

This symbol on the U-WAVE-R or on its packaging indicates that the U-WAVE-R shall not be treated as household waste. To reduce the environmental impact of WEEE (Waste Electrical and Electronic Equipment) and minimize the volume of WEEE entering landfills, please reuse and recycle.
For further information, please contact your local dealer or distributors.

[1] Name of Each Part and External Dimensions (Unit : mm)

1. POWER (Green LED)
2. ERROR (Red LED)
3. USB connector
4. INIT. Switch (Initialize switch)
5. Device ID label
6. Certification label



[2] Software Installation

The U-WAVE-R outputs measurement data to a personal computer using the dedicated software "U-WAVEPAK" included in the CD supplied as a standard accessory.
Before using the U-WAVE-R be sure to read the standard accessory "U-WAVE QUICK Manual" thoroughly, and then install the "U-WAVEPAK" and "USB Driver".

IMPORTANT

- Log in to Windows by 'Administrator'.
- Be sure to install the U-WAVEPAK before connecting the U-WAVE-R to a personal computer.
- When connecting the U-WAVE-R to a USB Hub, always use a self-powered USB Hub.
- The U-WAVE-R does not support the operation in the Standby or Hibernate of a personal computer. Cancel each setting in the U-WAVE-R prior to use.
- Please read the "U-WAVEPAK User's Manual" in "PDF_Manual" folder of the CD supplied as a standard accessory for a detailed operation method of U-WAVEPAK. "Adobe Reader" of Adobe Systems INC. is necessary to read.

[3] Setup

1) Setting the communication information

You need to set various information necessary for communication in the U-WAVE-R using the U-WAVEPAK. (No information is registered default setting.)
The information required to be set is as shown in the following table.

Item name	Description
Group ID	ID for grouping the U-WAVE-T and the U-WAVE-R. Communication is possible between the U-WAVE-T and the U-WAVE-R which have the same ID.
Band ID	Number of a radio band to be used
Lack of data monitoring level	The data transmitted from the U-WAVE-T to the U-WAVE-R includes a value that is incremented by one each time communication is implemented. The U-WAVE-R monitors this value and has a function to notify the personal computer of a data missing error. A lack of data monitoring level is a value for prescribing how frequently this error is notified.

IMPORTANT

- Please read the "U-WAVE Quick manual " and "U-WAVEPAK User's Manual" in "PDF_Manual" folder of the CD supplied as a standard accessory for setting the communication information.
- The U-WAVE-R will not function properly if a U-WAVE-R with the same group ID and band ID settings exists nearby. Be sure to set different information for each ID in the U-WAVE-R.

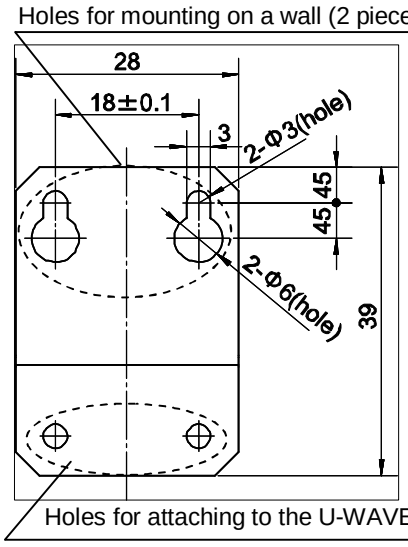
2) Installation procedure

Install the U-WAVE-R at a location with a good view and eliminate any obstacle between the U-WAVE-R and the U-WAVE-T. If installing it on a wall, etc., use the installation board (No. 02AZD815) from among the standard accessories. To install the U-WAVE-R on a wall, observe the following procedure.

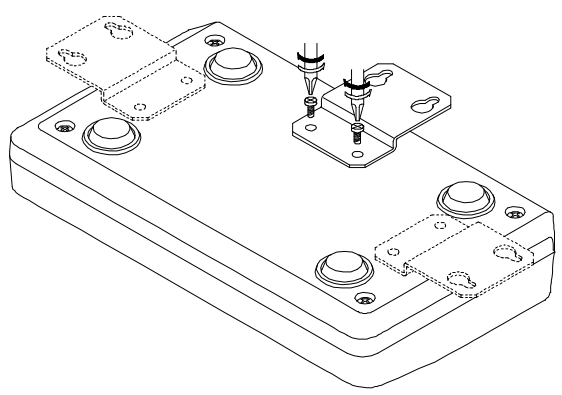
(1) Attach the mounting plate to the U-WAVE-R backside with cross-recessed head tapping screws (nominal size 2.6 × 6 No. A131-6221CP 2pcs.) in the standard accessories. Screw holes are provided on the U-WAVE-R backside so that the mounting plate can be fixed at one of three positions. Attach the mounting plate at an appropriate position where the U-WAVE-R is easily mounted.

(2) Install the U-WAVE-R on a wall at a desired location with the two screws. When installing the U-WAVE-R, refer to the following figure. Carefully install the U-WAVE-R so that it will not drop from the wall.

• Figure of the installation board(Unit : mm)



• Figure of how to attach the plate to the U-WAVE-R (Attachable at one of three positions.)



[4] Functions

1) Communication Function

The U-WAVE-R displays the data received from the U-WAVE-T.
Observe the following procedure for output operation.

(1) Connect the U-WAVE-R to a personal computer with a USB cable.
(2) Boot the U-WAVEPAK.
(3) Please read the “U-WAVE Quick manual “ and “U-WAVEPAK User’s Manual“ in “PDF_Manual” folder of the CD supplied as a standard accessory for setting correctly.
(4) Press the DATA switch on the connecting cable connected to the U-WAVE-T or the DATA switch on a Measuring tool to transmit data.
(5) The U-WAVE-R displays the received data and wireless transmits the confirm signal to the U-WAVE-T.
(6) U-WAVE-T receives the confirmation signal from U-WAVE-R, and can confirm the success (or failure) with LED (Buzzer).

IMPORTANT

- Log in to Windows by ‘Power Users’ or above.
- The U-WAVE-PAK automatically transmits the measurement data to the active application software (such as Microsoft Excel or Microsoft word). Before booting multiple application software simultaneously, be sure to activate the application software that you want to use.
- U-WAVE-R receives the data from the U-WAVE-T and wireless transmits the confirmation signal to the U-WAVE-T, even if U-WAVEPAK doesn't start . Please confirm measurements are displayed in the application software that is before the measurement begins that wants to be used.

2) Low power supply alarm

Red LED blinks when the voltage of the power supply from the personal computer decreases. (Green LED is in the state of lighting.)
Please change to a new USB cable at such a state.

3) Initializing the setting information

If communication is disabled while using the U-WAVE-R, first refer to section 5.
If communication is still disabled, initialize the information set in section 3 to default settings, and then retry setup.
Initialize the setting information with the following procedure.

(1) Close U-WAVEPAK activated on the personal computer, and then pull off the cable of the U-WAVE-R from the USB cable on the computer.
(2) While holding down the INIT. switch on the U-WAVE-R, plug the cable from the U-WAVE-R into the USB cable on the personal computer again. Wait for 3 seconds or more in this state. The setting information is initialized. At this time check that the green LED is blinking.
(3) Implement the setup again.

IMPORTANT

Once initialization is performed, the setting information used until then is all cleared.

[5] Troubleshooting

If any trouble is not corrected even when the following actions are taken, contact a Mitutoyo service center.
Please read the final page of “U-WAVEPAK User’s Manual“ in “PDF_Manual” folder of the CD supplied as a standard accessory about Mitutoyo service center.

1) Confirmation of U-WAVE-R

(1) The green LED will not light up (or start blinking).
- Is the power to the personal computer turned on?
- Is the USB cable connected between the U-WAVE-R and personal computer? The U-WAVE-R is supplied with power from the personal computer, and thereby no power will be supplied to the U-WAVE-R unless the personal computer is turned on. Check the USB cable for proper connection.
- Is the USB driver installed?

(2) The red LED is blinking with the green LED being lit.
- Is any undue force applied to the USB cable? Check the connecting condition of the USB cable. Also, the USB cable might be broken internally. Check it out by using a new USB cable.

(3) The green LED and red LED keep blinking alternately.
- Has setup been completed? Referring to the U-WAVEPAK User’s Manual, set up the system correctly.
- Does any U-WAVE-R with the same group ID and band ID exist near the U-WAVE-R? Set different information for each ID in the U-WAVE-R.

2) Confirmation of U-WAVE-T

(1) Data transmission always fails and the red LED lights up.
- Is the LCD of the Measuring tool put in the count display state? Communication is not possible if the LCD on the connected Measuring tool is turned off or in the data entry state. Put the Measuring tool LCD in the count display state.
- Has the battery voltage come down? If the battery is consumed to a low voltage, the red LED is blinking and data transmission is disabled. Replace the battery with a new one.
- Is the U-WAVE-T installed correctly on the Measuring tool? Recheck that the U-WAVE-T and the Measuring tool are properly mated using the supplied connecting cable. Also, when using the specific connecting cable (02AZD791A, B), be sure to mate the black-marked side of the connecting cable with the U-WAVE-T.
- Is the device ID described in the label on the U-WAVE-T set in the connecting state on the U-WAVEPAK? Unless it is in the connecting state, communication is not implemented. Referring to read the “U-WAVE Quick manual “ and “U-WAVEPAK User’s Manual“ in “PDF_Manual” folder of the CD supplied as a standard accessory, set up the system correctly.

(2) The U-WAVE-R search cannot be executed, blinking orange color LED disappears, and red LED blinks.
- Is the U-WAVE-T installed correctly on the Measuring tool? Recheck that the U-WAVE-T and the Measuring tool are properly mated using the supplied connecting cable. If U-WAVE-T is installed correctly on the Measuring tool correctly, initialize the setting information and then retry communication after referring “section 6 (2) in U-WAVE-T manual”

3) Confirmation of Wireless Communication Environments

Data communication is not stabilized, causing an error frequently.
- Is the U-WAVE-R separated too far from the U-WAVE-T?
- Is there any obstacle between the U-WAVE-R and the U-WAVE-T? First, bring these instruments close to each other, and then try communication between them. If an obstacle such as a wall or a metallic partition exists between the U-WAVE-R and U-WAVE-T, communication may be affected adversely. Also, the communication condition may be improved by changing the U-WAVE-R location and orientation.
- Is any microwave oven, wireless LAN, or Bluetooth used nearby? A wireless communication device or electric household appliance using a frequency of 2.4 GHz, which is close to the frequency used in the U-WAVE-R, might be affected adversely. Particularly, medical equipment could cause a threat to life due to electromagnetic interference. Carefully use the U-WAVE-R while separating sufficiently from such equipment. Also, check the situation of used bands at the periphery with the U-WAVEPAK and change the current band to that with better communication quality. It may be possible to stabilize communication.

Make an attempt on this, referring to “U-WAVEPAK User’s Manual“ in “PDF_Manual” folder of the CD supplied as a standard accessory.

[6] Specifications

Country	Japan, EU member countries, U.S.A, Canada
Code No.	02AZD810D
Certification number	005WWCA0167 (Japan) VXU-02AZD810D (U.S.A) 4396B-02AZD810D (Canada)
Transmission output	Less than 0 dBm (1 mW)
Distance of communication	Approx.20 m (at line-of-sight distance under office environments)
A Conformity standard	**Japan** ARIB STD-T66 **Europe** EN 50371：2002 EN 300 440-1 V1.3.1 and EN 300 440-2 V1.1.2 EN 301 489-01 V1.6.1 and EN 301 489-03 V1.4.1 **U.S.A** 47 CFR Part 15.247:(Subpart :C) 47 CFR Part 15,(Subpart :B) Canada RSS-210 (Issue 7) and RSS-Gen (Issue 2) ICES 003 (Issue 4)
Wireless communication protocol	IEEE802.15.4 compatible
Communication frequency	2.405 to 2.475 GHz
Used band	15 channels (at intervals of 5 MHz)
Modulation method	DSSS (Direct Sequence Spread Spectrum)
Wireless communication speed	250 Kbps
LED display	Green/red
Output to a personal computer	USB2.0 12 Mbps (equivalent to USB1.1)
Power supply system	USB bus power system
Operating temperature (humidity)	0 to 40°C (20 to 80%RH, with no condensation)
Storage temperature (humidity)	-10 to 60°C (20 to 80%RH, with no condensation)
External dimensions	140 × 80 × 31.6 (mm)
U-WAVE-R mass	Approx. 130 g

○ **Standard accessories**

- U-WAVE-R User’s Manual (this manual) No. 99MAL109B
- U-WAVE QUICK Manual No. 99MAL110B
- USB cable (1m) No. C177-008
- An Installation board No. 02AZD815
- Cross-recessed head tapping screws nominal size 2.6 × 6 No. A131-6221CP 2pcs.
- U-WAVEPAK No.02ARB110 (The following contents bundle into the CD)
  - U-WAVEPAK Program
  - USB Device Driver
  - Data Collection Macro for U-WAVE
  - U-WAVEPAK User’s Manual No. 99MAL216
- Warranty card

Mitutoyo Corporation

20-1, Sakado 1-Chome, Takatsu-ku, Kawasaki-shi, Kanagawa 213-8533, Japan

Mitutoyo